**Before the**
**FEDERAL COMMUNICATIONS COMMISSION**
**Washington, D.C. 20554**

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| In the Matter of | ) | |
| | ) | |
| The Boeing Company | ) | File No. SAT-LOA-20160622-00058 |
| | ) | Call Sign S2966 |
| Application for Authority to Launch and | ) | |
| Operate a Non-Geostationary Low Earth | ) | |
| Orbit Satellite System in the Fixed Satellite | ) | |
| Service | ) | |

**COMMENTS OF SES S.A. AND O3B LIMITED**

SES S.A. ("SES") and its subsidiary O3b Limited ("O3b"), pursuant to Section 25.154 of the Commission's Rules, 47 C.F.R. § 25.154, hereby submit these comments concerning the above-captioned application of The Boeing Company ("Boeing") for authority to launch and operate a non-geostationary orbit ("NGSO") fixed satellite service ("FSS") satellite system using V-band spectrum.[1] SES requests that any grant of the Boeing Application be conditioned to require Boeing to accommodate other NGSO networks and to comply with rules established by the International Telecommunication Union ("ITU") or the Commission for sharing between NGSO networks and future geostationary ("GSO") FSS satellites in the bands Boeing has identified. In addition, SES asks that the Commission consider the Boeing Application together with any other proposals made as part of the V-band NGSO processing round.

SES is one of the world's largest commercial communications satellite operators. SES subsidiaries operate more than 50 GSO satellites able to reach 99% of the world's

[1] *The Boeing Company*, Call Sign S2966, File No. SAT-LOA-20160622-00058 (the "Boeing Application").

population. Three of these entities – SES Americom, Inc., SES Satellites (Gibraltar) Ltd., and New Skies Satellites B.V. – hold Commission authorizations for GSO space stations, earth stations and U.S. market access. SES's GSO facilities provide satellite-based communications solutions to broadcasters, direct-to-home ("DTH") service providers, and corporate and government customers worldwide. SES GSO satellite capacity is used for such services as video and audio content distribution, DTH services, private networks, broadband services, satellite news gathering, broadcasting, aeronautical and maritime services, and mobile backhaul.

O3b, a wholly-owned subsidiary of SES, operates an NGSO FSS system in the Ka-band that has been granted U.S. market access.[2] O3b's system offers low-latency, high-throughput satellite connectivity – generally ten to one-hundred times the throughput of a traditional satellite – to Internet service providers, fixed and mobile network operators, large enterprises and governments, to enable fast, flexible and affordable broadband connectivity in locations unserved or underserved by terrestrial networks.

The Boeing Application requests authority to launch and operate a constellation of 2,956 NGSO FSS satellites in Low Earth Orbit ("LEO") using the 37.5-42.0 GHz (space-to-Earth) and the 47.2-50.2 GHz and 50.4-51.4 GHz (Earth-to-space) bands (collectively the "V-band").[3] All of these bands represent critical FSS expansion spectrum for both GSO and NGSO networks. Currently, SES is designing and manufacturing high throughput satellites that fully

[2] *O3b Limited*, Call Sign S2935, IBFS File Nos. SAT-LOI-20141029-00118 and SAT-AMD-20150115-00004, granted Jan. 22, 2015.

[3] *See* Boeing Application. Boeing also requested authority to operate in the 42.0-42.5 GHz and 51.4-52.4 GHz bands, but the Commission deferred consideration of those bands. *See* Satellite Policy Branch Information, Boeing Application Accepted for Filing in Part, IBFS File No. SAT-LOA-20160622-00058, Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 37.5-40.0 GHz, 40.0-42.0 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz Bands, Public Notice, DA 16-1244 (rel. Nov. 1, 2016) ("Processing Round Notice").

leverage the Ku- and Ka-bands, but it is clear that the increasing demand for capacity in the United States and around the world will require additional spectrum, particularly for gateway operations. SES has already begun studying technologies that can utilize the V-band to provide higher throughput service for GSO systems and additional capacity for NGSO operations. It is critical that the Commission ensure that Boeing and other V-band applicants design their systems in a way that facilitates robust use of the spectrum by both NGSO and GSO systems.

Boeing is required under No. 22.2 of the ITU Radio Regulations to protect FSS GSO networks in the V-band.[4] Furthermore, as Boeing notes in its application,[5] the ITU, pursuant to agenda item 1.6 of its agenda for World Radiocommunication Conference 2019 ("WRC-19"), is developing a regulatory framework to facilitate sharing between GSO and NGSO satellite systems.[6] Once that framework is developed, SES anticipates, and recommends, that the Commission initiate its own rulemaking to establish domestic sharing rules taking into account the findings of the ITU process. Boeing's system must be able to comply with ITU protection obligations and subsequent sharing rules established by the Commission, in order to ensure that both GSO and NGSO systems can access this spectrum effectively and without unnecessarily limiting the efficient use of this spectrum.

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[4] *See* ITU Radio Regulations 22.2. ("Non-geostationary-satellite systems shall not cause unacceptable interference to and, unless otherwise specified in these Regulations, shall not claim protection from geostationary-satellite networks in the fixed-satellite service and the broadcasting-satellite service operating in accordance with these Regulations.")

[5] *See* Boeing Application, Narrative at 82.

[6] *See* Resolution 159 (WRC-15), Studies of technical, operational issues and regulatory provisions for non-geostationary fixed-satellite services satellite systems in the frequency bands 37.5-39. GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space), ITU (2015), https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000C0006PDFE.pdf.

Boeing recognizes the need to be able to share with both GSO and NGSO systems in the bands it has identified and describes at a high level the techniques it will implement to ensure it can share with future satellite networks.[7] While these methods in theory could ensure that future GSO and NGSO satellites can operate efficiently and effectively in the same bands requested by Boeing, the Commission should condition Boeing's license on the need to comply with the ITU's existing protection obligations as they are ultimately modified by the ITU and with future Commission sharing rules. Sharing mechanisms themselves do not ensure that coordination with other future NGSO systems can be achieved. Specific coordination procedures established by the Commission are necessary to ensure that future NGSO systems have an ability to enter the U.S. market through successful coordination with the Boeing NGSO system. Such a condition is necessary to ensure that the large constellation Boeing seeks to operate in the V-band will not preclude future GSO or NGSO operators from expanding operations into the band.

A measured approach is particularly important given the complexity of sharing spectrum among all types of FSS networks in the V-band. SES believes that information about the other potential V-band NGSO systems is required in order to make a full assessment of the issues raised by Boeing's proposed 2,956 satellite constellation. While Boeing does address sharing with GSO and other NGSO systems in its application,[8] it is difficult to evaluate the

[7] *See* Boeing Application, Narrative at 81-82, 91-92.

[8] *See* Boeing Application, Narrative at 91, 92, 95, 99. In discussing Boeing's ability to share with GSO and other NGSO systems, Boeing repeatedly refers to Section V.A.2.C for a description of the system's sharing methodologies. However, Section V.A.2.C discusses sharing with Federal fixed and mobile services, not with other satellite networks. From the context, SES believes Boeing intended to refer to Section V.A.1.C, which addresses the proposed Boeing system's ability to share with Federal Space Systems. This section describes sharing mechanisms that could support sharing with future NGSO systems but does not discuss

effectiveness of the proposed sharing measures without defined coordination procedures between NGSO systems in the Commission's rules or information about other potential V-band NGSO systems. SES therefore urges the Commission to establish an opportunity for parties to comment on the Boeing Application and other filings in the processing round shortly after the processing round window has closed. SES respectfully requests that the Commission grant any necessary waiver of the comment filing deadlines established by the Processing Round Notice and Section 25.154 of the Commission's rules, 47 C.F.R. § 25.154, to permit consideration of any such comments.

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coordination procedures. The Commission must address specific coordination procedures for NGSO networks before the effectiveness of Boeing's proposed sharing mechanisms can be evaluated.

For the foregoing reasons, if the Commission ultimately grants the Boeing Application, it should impose a condition specifying that the system must comply with international and domestic requirements, including those being developed to facilitate sharing among FSS systems. The Commission should establish an opportunity for parties to comment on the Boeing Application and other filings in the processing round shortly after the processing round has closed to permit a comprehensive assessment of all proposed networks.

Respectfully submitted,

**SES S.A. AND O3B LIMITED**

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December 1, 2016

## CERTIFICATE OF SERVICE

I hereby certify that on this 1st day of December, 2016, I caused to be served a true copy of the foregoing "Comments of SES S.A. and O3b Limited" by first class mail, postage prepaid, upon the following:

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